

REMARKS/ARGUMENTS

Claims 8 and 21 have been rejected under 35 U.S.C. § 112, first paragraph, on the basis that the Examiner maintained that they failed to comply with the written description requirement. More specifically, the Examiner maintained that the claims contained subject matter which is not described in the specification in such a way as to reasonably convey to one of ordinary skill in the art that the inventors, at the time the application was filed, had possession of the claimed invention. Applicants have amended Claim 8 in a manner which is believed to render moot the rejection under 35 U.S.C. § 112 and Claim 21 has been cancelled, rendering the rejection thereof also moot. Applicant respectfully requests the Examiner to withdraw the rejection under 35 U.S.C. § 112.

The Office action of July 30, 2003 rejected a number of claims in view of reference to Lee. However, the Examiner provided the incorrect patent number for Lee and failed to provide a copy of Lee for Applicants' review and response. Applicants maintain therefore that the rejection could not have been made final and that Applicants are entitled to amend the claims as a matter of right, and have done so. In the alternative, Applicants respectfully request the Examiner to enter the proposed amendments in view of the fact that Applicantst did not have a copy of the Lee reference, U.S. Patent No. 6,251,782, and therefore Applicants did not have an opportunity to address the rejection in either of the prior two Office Actions.

Applicants maintain that the now-claimed invention would not have been obvious in view of Lee, et al. U.S. Patent No. 6,251,782, Buynoski U.S. Patent No. 6,078,088, Weber U.S. Patent No. 5,055,416, Asam U.S. Patent No. 4,199,377, Tobben, et al. U.S. Patent No. 5,977,635,

Gardner U.S. Patent No. 6,080,640, either individually or in combination, as relied on by the Examiner.

Lee, et al. U.S. Patent No.6,251,782 discloses a method of preparing a specimen by focused ion beam sectioning for examination under an electron-scanning microscope. The Examiner has focused on Lee, et al. at column 2, lines 52-54, which discloses that "the structure is then etched in a wet etchant such that it may be observed in an SEM for studying the characteristic feature or defect and its reason for being defective." However, Lee, et al. fails to disclose the use of a hydrophobic low dielectric constant dielectric layer and the problem associated with preparing a specimen thereof for view under a scanning electron microscope. In fact, Lee, et al. fails to disclose any specific etchant for use on the dielectric layer, which is an oxide insulating layer 44 (see col.6, lines 6-8). The Examiner's attention is respectfully directed to the paragraph bridging columns 6 and 7 which states at line 67, that "a suitable wet etchant can be used to etch away the insulating layer, i.e., the oxide layer such that a failed bit of the polished silicon gate and floating gate can be shown." As such, Lee, et al. fails to address the problem of preparing a specimen having a hydrophobic low dielectric layer as now called for in Applicants' independent Claim 8.

Weber teaches anodically etching a metal layer using an electrolyte solution, including ammonium hydroxide. All of the examples in Weber are directed to this invention. The only exception is the one paragraph cited by the Examiner in his rejection. However, the Examiner's attention is respectfully directed to column 4, lines 17-28 wherein Weber states: "Hydrochloric and hydrofluoric acids are volatile electrolytes which are incompatible for use in some applications of the subject invention." Weber states that each of hydrochloric and hydrofluoric

acid are volatile electrolytes. Weber further states that "specifically, hydrochloric and hydrofluoric acid tend to preferentially etch the interface region between the metal electrode and the substrate such as polyimide. This preferential etching sometimes proceeds rapidly in certain directions in a linear fashion, a phenomenon referred to as "craving." Craving is generally destructive of an amorphous silicon device." (See column 4, lines 21-28.) Weber is not directed to methods of preparing a specimen of a semiconductor device having a hydrophobic low dielectric constant dielectric layer as is the present invention as set forth in independent Claim 8. Independent Claim 8 would not have been obvious in view of Weber, independently or in combination with any of the other references of record.

Byunoski teaches two metal interconnect layers with a low dielectric constant material there between. However, Byunoski provides a teaching away effect in the paragraph bridging columns 4 and 5, which discloses that a low dielectric constant material (BCB) should be etched with a mixed oxygen-fluorine plasma. As such, Byunoski actually teaches away from etching a low dielectric material with an aqueous solution of hydrochloric and hydrofluoric acid as set forth in applicant's independent Claim 8. Further, it must be noted that Byunoski is not directed to the preparation of a species of a semiconductor device with the hydrophobic low dielectric constant dielectric material for viewing under a scanning electron microscope as set forth in Applicants' independent Claim 8.

Claims 9 (limitation of which are now included in claim 8) and 17 had been rejected under 35 USC 103 as being unpatentable over Buynoski in view of Weber and Lee as applied to claim 8 and further in view of Asam. The Examiner maintains that Asam teaches the etching step may be controlled by regulating etchant concentration. However, since Weber fails to

disclose Applicants' claimed etching solution comprising an aqueous solution of HCl and HF, then there is no identified "result effective variable" to be optimized. Furthermore, the teaching away effects of the numerous references of record, including Asam, cannot be overlooked in hindsight to identify a "result effective variable" and simply conclude that optimization thereof would have been within the skill of a person in the art. The Examiner has not provided any reason why a person of ordinary skill would selectively overlook the teaching away effect of several references.

Claims 10, 11 and 19 had been rejected under 35 USC 103 as being unpatentable over Buynosky in view of Weber and Lee as applied to claim 8, and further in view of Tobben. The Examiner has taken the position that it would have been obvious to modify Buynosky with the methyl silsesquioxane disclosed in Tobben. However, Tobben teaches etching the dielectric layer 112 with a conventional reactive ion etching process, see column 4, lines 48-15. Even if there is motivation to substitute dielectric layers, a person of ordinary skill in the art would not ignore the teaching away statements of Tobben with regard to etching techniques.

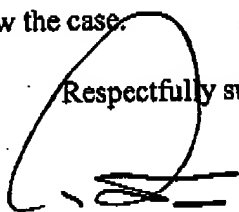
Claims 15 and 16 were rejected under 35 USC 103 as being unpatentable over Buynosky in view of Weber and Lee as applied to claim 8 and further in view of Gardner. Although Gardner teaches a variety of low dielectric layers, the addition of this reference cannot overcome the deficiencies of Weber and the teaching away effects of numerous references relied on by the Examiner.

Other references of record also teach away from Applicants' now claimed invention. Asam teaches etching borosilicate glass with hydrofluoric acid. Bernard, et al. teaches etching a polyimide with a solution of metal hydroxide (see col. 5, lines 36-39 and the Abstract).

A prima facie case of obviousness cannot be properly made by selectively picking and choosing isolated disclosure with addressing the numerous teaching away disclosures in the same references. Applicants maintain that no prima facie case of obviousness can be made for the now claimed invention in view of the prior art relied on by the Examiner.

In view of the above amendments and remarks, applicants respectfully request reconsideration and allowance of the claims now the case.

Respectfully submitted


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